REMARKS

Claims 1-4, 7-15, and 18-20 are all the claims pending in the application, claims 5, 6, 16 and 17 having been canceled in previous amendments.

Claims 1-4, 7-15 and 20 stand rejected under 35 U.S.C. §112, first paragraph. Claims 1, 2 and 7-12 stand rejected under 35 U.S.C. §102(b) as being anticipated by Colin (U.S. Patent No. 3,805,091). Claims 1, 2 and 7-12 stand rejected under 35 U.S.C. §102(b) as being anticipated by Clark Jr. et al. (hereinafter Clark Jr.) (U.S. Patent No. 4,365,533). Claims 1, 2 and 7-12 stand rejected under 35 U.S.C. §102(b) as being anticipated by Deutsch (U.S. Patent No. 4,122,742). Claims 1, 2 and 7-12 stand rejected under 35 U.S.C. §102(b)/(e) as being anticipated by either of Hewitt et al. (hereinafter Hewitt) (U.S. Patent No. 5,668,338) or Norris et al. (hereinafter Norris) (U.S. Patent No. 6,407,073). Claims 1-4 stand rejected under 35 U.S.C. §102(b) as being anticipated by Martel (U.S. Patent No. 5,070,399). Claims 1, 2 and 7-12 stand rejected under 35 U.S.C. §102(b) as being anticipated by Kellogg et al. (hereinafter Kellogg) (U.S. Patent No. 5,033,352). Claim 20 stands rejected under 35 U.S.C. §102(b) as being anticipated by either of Gruenbaum (U.S. Patent No. 5,565,641) or Fujita et al. (hereinafter Fujita) (U.S. Patent No. 5,471,008). Claims 20 stands rejected under 35 U.S.C. §102(a) as being anticipated by either of Kushimiya (U.S. Patent No. 5,741,993) or Hewlett et al. (hereinafter Hewlett) (U.S. Patent No. 5,675,100). Claim 20 stands rejected under 35 U.S.C. §102(e) as being anticipated by Su et al. (hereinafter Su) (U.S. Patent No. 5,852,251). Claims 15, 18 and 19 stand rejected under 35 U.S.C. §102(b) as being anticipated by either of Farrett el al. (hereinafter Farrett) (U.S. Patent No. 5,281,754) or Greene et al. (hereinafter Greene) (U.S. Patent No. 5,262,585). Claims 15, 18 and 19 stand rejected under 35 U.S.C. §102(e) as being

anticipated by Fay et al. (hereinafter Fay) (U.S. Patent No. 5,827,989). Applicant respectfully traverses these rejections, and requests reconsideration and allowance of the pending claims in view of the following arguments.

Rejection under § 112

The Examiner has rejected claims 1-4, 7-15 and 20 under 35 U.S.C. §112, first paragraph. Applicant respectfully acknowledges the Examiner's position on this matter. And while Applicant has provided the foregoing claim amendments on this issue to advance the prosecution of this application, Applicant does so without conceding to the characterization of these claims articulated in the Office Action. Thus, the foregoing claim amendments are believed fully responsive to the points raised in the Office Action, and accordingly, Applicant requests reconsideration and withdrawal of this rejection.

Rejections to Independent Claims 1 & 2

The Examiner has rejected independent claims 1, 2, and 7-12 under 35 U.S.C. §102(b) as being anticipated by any one of Colin, Clark Jr., or Deutsch; claims 1, 2 and 7-12 under 35 U.S.C. §102(b)/(e) as being anticipated by either of Hewitt or Norris; claims 1-4 under 35 U.S.C. §102(b) as being anticipated by Martel; claims 1, 2 and 7-12 under 35 U.S.C. §102(b) as being anticipated by Kellogg.

Independent claims 1 and 2 are directed to a system and method for generating at least one outgoing real-time digital control signal based on at least one incoming control signal. These claims include, *inter alia*, at least one control signal generator adapted to generate the at least one outgoing real-time digital control signal, as well as the use of the incoming control signal to control events and parameters associated with the control signal

generator. Applicant will show in the following arguments that each of the cited references does not teach or disclose one or more features recited in the claims at issue.

<u>Colin</u>

Colin relates in general to electronic circuits for use in electronic musical instruments, and includes only two brief discussions relating to transient generators. Colin describes one transient generator as including a transconductor-based integrator circuit that may be operated as a "shaped transient generator by applying proper predetermined voltage patterns to the signal and control inputs" (Colin co. 2, lines 4-7) Additional description relating to transient generators is shown in Figure 3 and described at col. 5 lines 31-63. However, the limited teachings of Colin simply amount to a description of a classic use of an envelope generator in a musical sound synthesis arrangement. Although Colin may well describe transient generators that generate some type of signal, it is clear that the signal generated in the Colin system is <u>analog</u>, not <u>digital</u>, as recited in Applicant's claims 1 and 2.

A further distinction relates to Applicant's use of incoming control signals <u>to control</u> aspects associated with the control signal generator. Assuming *arguendo* that Colin's "predetermined voltage patterns" teach Applicant's "incoming control signals", this reference does not provide any teaching of using these "predetermined voltage patterns" <u>to control</u> aspects associated with the control signal generator (e.g., transient generator). Accordingly, the claimed invention is distinguishable for this additional reason.

<u>Clark Jr.</u>

Clark Jr. is similarly deficient since this reference lacks the requisite teachings relating to the use of <u>incoming</u> control signals <u>to control</u> aspects associated with the control

signal generator, as well as to Clark Jr.'s analog output generation not teaching Applicant's generation of outgoing real-time digital control signals.

For example, Applicant acknowledges Clark Jr.'s teachings relating to various transient generators and glissando systems (Clark Jr.'s, Figures 23, 26, 27, as well as Figure 28 cited by the Examiner). Applicant respectfully points out, however, that the output signals of the transient generators (Figure 3, element 264) and glissando generators (Figure 3, element 159) are analog, not digital (*See e.g.*, col. 40 lines 35-54). In addition, Clark Jr. lacks any teaching relating to the use of incoming control signals to control a transient generator, and therefore cannot teach Applicant's use of incoming control signals to control aspects associated with the control signal generator, as recited in claims 1 and 2.

Deutsch

The Examiner asserts that Deutsch teaches Applicant's "incoming control signals" feature since this reference provides signals to control attack and release 17. Applicant respectfully disagrees and submits that while Deutsch provides teachings related to transient generators, it is deficient as an anticipating reference in many respects.

In Deutsch, whenever a switch is actuated on the instrument keyboard switches 18, its actuation is detected by the note detect and assignor 17 (Deutsch col. 4, lines 38-40). Put another way, Deutsch describes incoming signals (apparently created by switches 18) that are detected by the assignor 17, which in turn generates a frequency (detect signal) that is fed into the attack/release generator 21 (ARG) (Deutsch, Figure 1). Consequently, Deutsch simply describes feeding internal keyboard 18 signals to the assignor 17, which in turn produces an internally generated detect signal that is fed into the ARG 21 (Deutsch col. 4, lines 37-49, col. 7, lines 59-65).

Assuming *arguendo* that ARG 21 teaches Applicant's control signal generator feature, this reference does not teach using incoming signals to control the ARG 21. To the contrary and as described above, the signals being fed into the ARG 21 are internally generated by the assignor 17, and are thus not incoming control signals. In sum, Deutsch merely shows providing internally generated signals to the ARG 21, and therefore does not teach Applicant's use of incoming control signals to control events and parameters associated with the control signal generator, as recited in claims 1 and 2.

A further distinction relates to the claimed invention (claims 1 and 2) generating outgoing real-time digital control signals via an outgoing control signal interface. Looking again to Deutsch, it can clearly be seen that output from the ARG 21 does not generate an outgoing signal, and instead, generates a "select signal" that is passed to an internal system component (note select 13), and then on to an assortment of other internal components (Deutsch Figure 1). Accordingly, Applicant's "outgoing control signal generation" feature is also not taught by this reference.

Norris & Hewitt

Applicant's review of Norris and Hewitt found these references to be substantially identical as to the relevant matters at issue. Accordingly, Applicant's arguments with respect to Norris are equally applicable to Hewitt.

Applicant's review of Norris reveals description relating to the use of a LFO generator for signal generation, as the Examiner asserts. However, the Norris LFO generator 1021 generates LFO signals that are internally used to create either vibrato or tremolo effects (Norris, col. 126, lines 20-25; Figure 102); and therefore does not teach outgoing real-time digital control signals as recited in claims 1 and 2.

Another distinction relates to Applicant's "incoming control signal" feature. Assuming for the sake of argument that the LFO generator 1021 in Norris teaches Applicant's "incoming control signal" feature, this reference does not teach the use of incoming signals to control the LFO generator 1021. As shown in Norris, Figure 102, LFO control information is read into the LFO generator 1021 from wave table data 1002. Clearly, wave table data 1002 does not represent an incoming control signal. Accordingly, while the Norris system may well teach the use of internal table data 1002 to provide control (if any) of a LFO generator 1021, it surely does not teach or disclose incoming control signals to control events and parameters associated with the control signal generator, as recited in claims 1 and 2.

Martel

Applicant's review of Martel reveals, as the Examiner asserts, that this references shows a LFO 1 receiving an incoming signal from a digital control signal source 15 (Martel Figure 1). However, a further review of Martel finds that output from the LFO 1 is analog, not digital (Martel col. 4, lines 49-52). Accordingly, Martel's limited "analog" teachings do not teach or disclose an outgoing real-time digital control signal as recited in claims 1 and 2.

Kellogg

The Examiner asserts that Kellogg discloses a LFO 30 controlled by an incoming control signal, thus teaching claims 1 and 2. Applicant respectfully disagrees.

Kellogg shows a LFO 30 receiving input (KON) from an internal interface controller 2. As described, the interface controller 2 scans an externally configured keyboard 4 to find depressed keys, and then produces key-on data (KON) that is later provided to the LFO 30 (Kellogg col. 4, lines 44-55). The shortcomings of Kellogg is similar to that of Deutsch

such that Kellogg describes an external system (keyboard 4) providing incoming signals to an internal component (interface controller 2), which then internally produces signals (KON) that are provided to the LFO 30. Kellogg at best teaches providing a LFO 30 with internally generated signals (KON), and therefore does not teach or disclose the use of incoming control signals to control events and parameters associated with the control signal generator, as recited in claims 1 and 2.

A further distinction is that in Kellogg, the LFO 30 provides low frequency data to several internal system components including a multiplier 32, multipliers 36 and 38, and to a pitch-envelope generator 28 (Kellogg col. 5, lines 5-12). Accordingly, while the Kellogg system may well teach a LFO generator 30 that supplies data to an assortment of internal components, it does not teach a control signal generator that generates outgoing real-time digital control signals as recited in claims 1 and 2.

In view of the above, Applicant asserts that each of Colin, Clark Jr., Deutsch, Hewitt, Norris, Martel, and Kellogg do not teach at least one feature recited in independent claims 1 and 2. Accordingly, claims 1 and 2, and their respective dependencies, claims 3-4, and 7-12, are patentable.

Rejections to Claim 20

The Examiner has rejected claim 20 under 35 U.S.C. §102(b) as being anticipated by either Gruenbaum or Fujita; under 35 U.S.C. §102(a) as being anticipated by either Kushimiya or Hewlett; and under 35 U.S.C. §102(e) as being anticipated by Su.

Gruenbaum

Gruenbaum describes a system for sending MIDI continuous controller data and includes a feature which allows a user to manipulate the pitch of an audio source by striking

keys on a "keyboard" (Gruenbaum col. 12, 33-40; and elements 58 and 60 in Figure 3). Importantly, the just-described use of "keyboard" refers to a computer keyboard 118, and thus does not generate incoming MIDI data (Gruenbaum col. 7, lines 18-33; Figure 8). At best, Gruenbaum describes a system for remapping of pitch assignments and scales to incoming MIDI note data, and lacks any teaching, whatsoever, to changing an incoming MIDI message using any of the conversion methods recited in claim 20.

In the event the Examiner continues to maintain that Gruenbaum does disclose one or more incoming MIDI message conversions methods recited in claim 20, Applicant respectfully requests the Examiner to point out the specific portions of Gruenbaum, which, in the opinion of the Examiner, contain the alleged teaching, and explain how the cited portions need be interpreted in order to arrive at the Examiner's conclusions. It is well settled in the law that when the Examiner asserts that there is an explicit or implicit teaching or suggestion in the prior art, he must indicate where exactly such teaching or suggestion appears in the reference. See In re Rijckaert, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993).

Fujita

Fujita describes assorted MIDI message conversion techniques. However, the MIDI message conversion techniques disclosed in this reference is limited to the changing of MIDI channel numbers, and therefore lacks the requisite teachings to anticipate any of the conversion methods recited in claim 20 (Fujita col. 4, lines 35-43; and col. 5, lines 19-33).

Applicant's reading of Fujita finds that the only relevant description relating to MIDI message conversion techniques relate to the alteration of the numerical value of a MIDI note velocity value (of a MIDI "note on" message) as a function of volume information (Fujita col. 43 line 26 to col. 46, line 63). Notably, the volume information is

provided by a fader control on the unit (Fujita col. 43, lines 43-45). Accordingly, Fujita's limited teachings pertains to MIDI message conversion methods where the velocity of the input note information is replaced with velocity values corresponding to fader positioning (Fujita col. 43, lines 43-45; Figure 54 and 55). However, Fujita lacks any teaching regarding the changing of an incoming MIDI message using any of the conversion methods recited in claim 20.

Kushimiya

Kushimiya is directed to an electronic keyboard that utilizes non-anticipating MIDI message conversion method of MIDI value addition (Kushimiya col. 5, liens 14-19). In that system, a pitch bender 4 generates a pitch bend signal that is transmitted as a "bender MIDI value" that is eventually added to a "MIDI output value" (Kushimiya col. 5, lines 14-19; col. 6 lines 39-42; and Figure 4). Accordingly, Kushimiya provides, at best, disclosure relating to the addition of a bender MIDI value to a MIDI output value, but fails to provide any teachings regarding the changing of an incoming MIDI message using any of the conversion methods recited in claim 20.

Hewlett

Hewlett provides a system for communication music printing information by encoding enharmonic pitch in low order bits of MIDI note-on velocity information (Hewlett, Abstract). This system provides, in effect, a low-order bit robbing scheme for implementing independent additional communication channels to carry information useful in music notation printing directly from MIDI signals. However, Applicant is unable to find any discussion in this reference relating to the changing of an incoming MIDI message using any of the conversion methods recited in claim 20.

Su

Su is directed to a MIDI control system involving MIDI file modification of stored MIDI files. In this system, a stored MIDI file 418 undergoes an amount of processing to produce an altered MIDI file 422 (Su, Figure 4). The processing of the MIDI file is limited to reformatting of files, the elimination of events, and the grouping of various MIDI channels or MIDI channel voice messages (Su, col. 2, line 52 to col. 3, line 4). However, that is the relevant extent of MIDI message processing provided in Su, and as such, this reference does not provide the requisite teachings to anticipate any of the MIDI message conversion methods recited in claim 20.

In view of the above, Applicant asserts that each of Gruenbaum, Fujita, Kushimiya, Hewlett, and Su do not teach at least one feature recited in independent 20, and that this claim is therefore patentable.

Rejections to Claim 15, 18, 19

The Examiner has rejected claims 15, 18 and 19 under 35 U.S.C. §102(b) as being anticipated by either Farrett or Greene; and under 35 U.S.C. §102(e) as being anticipated by Fay.

Farrett & Greene

Farrett and Greene are systems that provide MIDI output by implementing basic techniques of merging multiple MIDI streams. For example, Figure 2 of Farrett shows the merging of an assortment of separate MIDI data, ultimately resulting in a MIDI data stream (Farrett, col. 4, line 56 to col. 5 lines 57). Similarly, Greene shows data "outputted from portions 36, 40 are software merged into MIDI out data 48" (Greene, col. 5, lines 30-33;

Figure 2). While Farrett and Greene provide respective teachings relating to the merging of MIDI data, these references do not teach generating of an outgoing digital control signal based upon a non-merging combination of two control signals comprising MIDI messages, as recited in independent claim 15.

Fay

Fay is directed to a system for processing musical data, which includes a method to represent musical events by using a single curve event when editing, storing or transmitting the musical data, and then converging the single curve event back into a series of discrete MIDI events when the musical data is being performed (Fay, co. 2. lines 10-14). Although Fay describes at length methods for representing and later editing MIDI data, the description provided relates to processing of a single MIDI signal, whereas the claim 15 recites first and second incoming control signals.

In view of the above, Applicant asserts that each of Farrett, Greene, and Fay do not teach at least one feature recited in independent 15. Accordingly, claims 15, and its dependencies, claims 18-19, are patentable.

The Examiner's rejections having been overcome, Applicant submits that the subject application is in condition for allowance. The Examiner is respectfully requested to contact the undersigned at the telephone number listed below to discuss other changes deemed necessary.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please enter the following amended claims:

1. (Twice Amended) A system for the generation of at least one outgoing real-time digital control signal based on at least one incoming control signal, the system comprising:

an incoming control signal interface adapted to receive the at least one incoming control signal;

at least one control signal generator adapted to generate the at least one outgoing real-time digital control signal based on the at least one incoming control signal, wherein said at least one control signal generator is selected from the group consisting of: [of one of the following types:]

a low frequency oscillator, and

a transient generator;

an outgoing control signal interface adapted to communicate the generated at least one outgoing real-time digital control signal; and

wherein the at least one incoming control signal is used to control events and parameters associated with the at least one control signal generator.

2. (Twice Amended) A method for the generation of at least one outgoing real-time digital control signal based on at least one incoming control signal, the [system] method comprising:

receiving the at least one incoming control signal;

controlling events and parameters associated with at least one control signal generator using the at least one incoming control signal;

generating the at least one outgoing real-time digital control signal utilizing the at least one control signal generator, wherein the at least one control signal generator is selected from the group consisting of: [of one of the following types:]

a low frequency oscillator, and

a transient generator

[wherein the at least one incoming control signal is used to control events and parameters associated with the at least one control signal generator.]

communicating the generated at least one outgoing real-time digital control signal to an external system via an outgoing control signal interface.

3. The system of claim 1 wherein said at least one outgoing real-time digital control signal is in the form of a MIDI message.

4. The method of claim 2 wherein said at least one outgoing real-time digital control signal is in the form of a MIDI message.

5. Cancelled

6. Cancelled

7. The system of claim 1 wherein the at least one control signal generator is a transient generator comprising an envelope generator with at least one parameter controlled by the at least one incoming control signal.

8. The system of claim 1 wherein the at least one control signal generator is a transient generator comprising a ramp generator with at least one parameter controlled by the at least one incoming control signal.

9. The system of claim 1 wherein the at least one control signal generator is a transient generator comprising a slew limiter with at least one parameter controlled by the at least one incoming control signal.

10. The method of claim 2 wherein the at least one control signal generator is a transient generator comprising an envelope generator with at least one parameter controlled by the at least one incoming control signal.

11. The method of claim 2 wherein the at least one control signal generator is a transient generator comprising a ramp generator with at least one parameter controlled by the at least one incoming control signal.

12. The method of claim 2 wherein the at least one control signal generator is a transient generator comprising a slew limiter with at least one parameter controlled by the at least one incoming control signal.

13. The system of claim 3 wherein the at least one incoming control signal comprises MIDI messages.

14. The method of claim 4 wherein the at least one incoming control signal comprises MIDI messages.

15. (Twice Amended) A method for generating at least one outgoing digital control signal utilizing at least one control signal processor, the method comprising:

processing a first incoming real-time control signal;

processing a second incoming control signal;

<u>generating</u> [determining] the at least one outgoing digital control signal based upon a <u>non-merging</u> combination of the first incoming real-time control signal and the second incoming control signal; and

wherein the first incoming real-time control signal, the second incoming control signal, and the at least one outgoing digital control signal comprise MIDI messages.

16. Canceled

17. Canceled

18. The method of claim 15 wherein both the first incoming real-time control signal and the second incoming control signal comprise values, and wherein the control signal processor performs one operation selected from the group consisting of:

- multiplication of the values of the first and second incoming control signals;
- addition of the values of the first and second incoming control signals.

19. The method of claim 15 wherein a temporal sequence of the first and second incoming control signals is used to generate the at least one outgoing digital control signal.

20. (Once Amended) A method for processing an incoming real-time MIDI control signal, the method comprising:

<u>receiving the incoming real-time MIDI control signal;</u>

generating an outgoing real-time MIDI control signal, wherein said generating is performed by one or more message conversion methods selected from the group consisting of:

- changing an incoming MIDI note number value to an outgoing MIDI continuous controller value
- changing an incoming MIDI note velocity value to an outgoing MIDI continuous controller value
- changing an incoming MIDI continuous controller value to an outgoing MIDI note value
- changing an incoming MIDI continuous controller value to an outgoing MIDI continuous controller value with scaling
- changing an incoming MIDI continuous controller value to an outgoing MIDI continuous controller value with offset
- changing an incoming MIDI continuous controller value to an outgoing MIDI continuous controller value with complementary magnitude

- changing an incoming MIDI note number value to an outgoing MIDI note number value according to variably transposed intelligent harmony that is controlled by the incoming real-time MIDI control signal [.]; and

communicating the generated outgoing real-time MIDI control signal to an external system via an outgoing control signal interface.